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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Anton Bech

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STITES & HARBISON PLLC
1199 NORTH FAIRFAX STREET
SUITE 900
ALEXANDRIA, VA 22314

EXAMINER

HUDA, SAEED M

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/599,152	Applicant(s) BECH, ANTON	
	Examiner SAEED M. HUDA	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25,27-29,31 and 41-51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25,27-29,31 and 41-51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The response filed on 11/25/2009 has been fully considered and entered into the record. Claims 26, 30, and 32-40 are cancelled and the rejections applying to the cancelled claims withdrawn. New claims 41-51 have been entered.
2. The indefinite rejection for claims 1-31 is withdrawn due to appropriate correction by applicant.

Response to Arguments

3. Applicant's arguments with respect to claims 1-31 have been considered but are moot in view of the new ground(s) of rejection, to the extent that the arguments are applicable to the new grounds of rejection; they are addressed below.

Applicant states that Furuya discloses a mold having a main body 10 comprising a porous structure with steel balls 12 having opening where the steel balls are mutually connected and cooperating with the evacuating bores 20 of the surface layer 5 for evacuating the mold. Applicant states that nowhere in Furuya there is disclosed any kind of substantially airtight structure, be it part of the support structure or the air drainage system. Applicant goes on to state that such an airtight structure provides advantages. The Examiner is in agreement that Furuya does not teach an airtight structure, but in order to rectify the deficiency of this reference, The Examiner provided for a secondary reference in the previous action, Bezzola to teach this subject matter. The combination of references will be provided for below.

Applicant states that Bezzola teaches a composite tool having a metal surface for vacuum forming. The support structure for this tool surface is provided in the form of a porous layer and the complete support structure is surrounded by an impervious covering in order to enable evacuation of the support structure and subsequently evacuating air from the tool surface. Applicant states that in contrast to the present invention, the support structure 18 of Bezzola is part of the drainage system, whereas the support structure of the present invention is separated from the air drainage system an air-tight structure. However, the support structure of Furaya, the primary reference, is separate from the drainage system and is relied upon to teach this subject matter.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-25, 27-29, 31, 41-44, 46, and 48-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furuya et al. (US 6499715 B1) in view of Bezzola (WO 99/07532).

a. Regarding claims 1, 13, 23-24, 28, 31, and 49-51, Furuya et al. teach a resin mold that has a surface layer (active mold surface) (abstract) where the mold can be evacuated to make a vacuum formed sheet or panel product (column 6, lines 45-49) and the use of cooling pipes 24 (column 4, lines 27-40). This would indicate that there is an air-drainage system present. The surface of

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the mold has bores through which air can travel (air permeable) and air may be transported between the active mold surface and the air drainage system. The air permeable surface member forms the substantially entire active mold surface (figure 1, column 4, lines 26-40, and column 6, lines 45-49). Furuya et al. go on to teach a main body 10 (support structure) is arranged to support the air-drainage system (including the cooling pipes) and the air permeable surface which is composed of steel balls (additional component of the air-drainage system) (column 2, lines 53-55 and figure 1). The main body is used to support the mold and it can be seen that the support structure would provide for a major part of the load bearing ability of the mold (figure 1). Furuya et al. fail to teach that the support structure forms an entire surface which is substantially airtight.

Bezzola teaches a plastic tool formed from a casting resin that has a working face which comprises a pre-formed metal sheet (abstract). Bezzola teaches the use of a base where said base is made of a porous layer 18 that is surrounded by an impervious covering 24 (i.e. would be airtight) (bottom of page 6 and figures). Bezzola go on to state that a vacuum line is present that would pull suction through the bottom portion of component 24 (figures). It would have been obvious to one having ordinary skill in the art at the time of the invention to use the impervious covering of Bezzola to make the base structure of Furuya et al. airtight because this allows the air pulled through the surface of the mold to be directed to a specific location for removal. If the air was pulled through a mold

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that was not airtight, this would result in a process and apparatus that was inefficient.

a. Regarding claim 2 and 6, Furuya et al. in view of Bezzola teaches that the air transport system comprises a network (channels) for transport of air (Furuya et al. figure 1 #20 and #24) where said network follows the active mold surface (Furuya et al. figure 1).

b. Regarding claim 3, Furuya et al. in view of Bezzola teach that the system used to evacuate air through (air drainage system) is comprised of a permeable surface which is composed of steel balls (islands of solid material) (Furuya et al. column 2, lines 53-55 and figure 1). It would follow that air that is pulled via vacuum through the mold would pass through the spaces between the network of islands (Furuya et al. figures).

c. Regarding claim 4, Furuya et al. in view of Bezzola teach that the mold has steel balls (islands) with a circular cross-sectional shape (Furuya et al. figures).

d. Regarding claim 5, Furuya et al. in view of Bezzola teach that the balls are connected (Furuya et al. figures) and the point of connection can be considered to be the connector. From the figures, it can be seen that the connector height is smaller than the height of the islands. In the event that the connectors, as described above, do not read on the claimed connectors, it would have been obvious to one having ordinary skill in the art at the time of the invention to space the balls as necessary to get the desired airflow and that this spacing would be

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provided via the use of connector pieces placed such that airflow would be preserved. The size of the connector pieces would be smaller than the island because if the pieces were larger than the islands, the airflow holes would be too large.

e. Regarding claim 7, the claimed cross section for air transport is merely dictated by the desired amount of air flow through the channel; therefore, they do not impart any patentably inventive concept to the claimed invention.

f. Regarding claims 8-9, some of the transport channels of Furuya et al. would necessarily be parallel or cross. The claimed distance between some of the channels air transport is merely dictated by the desired amount of air flow through the channel; therefore, they do not impart any patentably inventive concept to the claimed invention.

g. Regarding claims 10-11, Furuya et al. in view of Bezzola teach that the air drainage system and the air permeable surface is integrated with the support structure (Furuya et al. figure 1).

h. Regarding claim 12, Furuya et al. in view of Bezzola teach air-drainage system is positioned between the support structure and the air-permeable surface member (Furuya et al. figure 1).

i. Regarding claims 14-20, 45, and 47, the refraction of claim 1 above teaches the passage structures. The claimed percentage of openings, opening size, and density, open volume, distance between the mold and air-drainage system are merely dictated by the desired amount of air flow through the

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channel; therefore, they do not impart any patentably inventive concept to the claimed invention.

j. Regarding claim 21, the surface is sufficiently rigid in that it is made of silicon carbide and metal particles (Furuya et al. abstract).

k. Regarding claim 22, Furuya et al. in view of Bezzola teach that the mold's air permeable surface which is composed of steel balls (column 2, lines 53-55 and figure 1), which is a heat resistant material. This would indicate that the surface is mechanically and chemically stable at the curing temperature. The softening and melting points of steel are well above the claimed temperatures.

l. Regarding claim 25, Furuya et al. in view of Bezzola teach the use of a vacuum forming tool made of polyurethane and other foam molds and polystyrene foam molds (Bezzola page 3, paragraph 1).

m. Regarding claim 27, Furuya et al. in view of Bezzola fail to teach the use of a mold release agent; however, it would have been obvious to one having ordinary skill in the art at the time of the invention to use mold release to prevent the produced article from sticking to the mold and circumvent the need of having to force the article from the mold surface which may damage the surface.

n. Regarding claim 29, it would have been obvious to one having ordinary skill in the art at the time of the invention to have the mold surface secured releasably to the air drainage system in that it could be detached for easy cleaning and refurbishing.

o. Regarding claim 41, the network follows the active mold surface (figures).

- p. Regarding claim 42, the space between the islands forms a planar network for transport of air (figures).
- q. Regarding claim 43, the islands have a cross section substantially resembling circles (figures).
- r. Regarding claim 44, the air drainages system is an independent member (figures).
- s. Regarding claim 46 and 48, the balls of Furuya et al. would necessarily be sintered to make sure that they are stable. With regards to the claimed percentage, see the rejection of claim 14.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAEED M. HUDA whose telephone number is (571)270-5514. The examiner can normally be reached on 8:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KHANH NGUYEN/
Primary Examiner, Art Unit 1791

/SAEED M. HUDA/
Examiner, Art Unit 1791